

CUSHING & JAMMALLO, INC.

August 28, 2001

Mr. David C. Bowen
Hazardous Waste Remediation Bureau
New Hampshire Department of Environmental Services
6 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03302-0095



Re: *Site Investigation Report*
Johnson & Johnston Associates, Inc.
130 Route 111
Hampstead, New Hampshire
NHDES# 200001038

Dear Mr. Bowen:

On behalf of Johnson & Johnston Associates, Inc. (JJA) and in response to the Department of Environmental Services' (NHDES) letter of July 10, 2001 concerning the "Site Investigation Report" dated December 12, 2000 for the above-referenced site, Cushing & Jammallo, Inc. (Cushing & Jammallo) has prepared the following Scope of Work to address your requests for additional information/investigations. Prior to presenting the Scope of Work, however, we would like to respond to your questions concerning the use and construction of the former catch basin located adjacent to the eastern side of the Operations Building.

Catch Basin East of Operations Building

Page 2 of your letter requests that JJA investigate the catch basin as a potential source of contamination; describe the construction and closure of the catch basin; describe any piping that may discharge from the catch basin and characterization of the outfall; describe any connections to the catch basin, such as floor drains; and detail any other activities that may have contributed contamination to the catch basin.

JJA and Cushing & Jammallo are of the opinion that this catch basin was not an active source for significant quantities of contaminant contribution to the subsurface environment during the period in which it operated. Further, with the construction of the addition to the Operations Building over this drain in the second quarter of 2000 (after JJA had discussions with Mr. James B. Zeppieri of the NHDES), this drain has been abandoned and closed out. The drain was filled in with soil prior to the building addition being constructed over this area. This former drain was substituted with a new drain or catch basin that was constructed exterior to and east of the new building addition. The new drain was tied into the former subsurface drainage piping associated with the former drain/catch basin that discharges to the wetland area north of the Operations Building. Since the catch basin has been removed and closed, further direct investigations of this former catch basin as a potential past source of contamination can be practically or reasonably

performed and evaluated via the use of monitoring well ATC-2.

Sections 3.0 (page 9), 8.1.1.1 (page 55), and 9.1 (page 74) discuss the storm drain/catch basin and the reported release to this drainage structure that occurred in 1989. According to the incident report prepared by Service Chemical Corp. dated October 16, 1989, 15 to 20 gallons of 1,1,1-trichloroethane was released to this storm drain that located beneath the delivery truck. The storm drain in question was located immediately adjacent to monitoring well ATC-2 that was installed by ATC Associates Inc. (ATC) in November 1999. The storm drain discharged to the wetland located north of the Operations Building. When the chemical was being transferred from the truck to the storage tank located inside the building, a gasket came loose inside the transfer hose, producing the leak. Service Chemical Corp. cleaned "waste sludge" out the 8-inch diameter sump located inside the drain, collected samples from the "end of the drain pipe", and submitted the samples to a laboratory for testing. One 55-gallon drum of "waste sludge from the sump was generate, labeled and marked". No 1,1,1-trichloroethane was indicated in the testing results. The NHDES was contacted and they "suggested flushing the drain to remove any additional contamination". This task was performed on the same day and generated "two drums of wastewater". Two additional effluent samples were collected and analyzed at a laboratory. The incident report states that "again no contamination was found". The NHDES further described the human/environmental hazards associated with this release as "minimal due to clean-up" and no further actions were required.

SCOPE OF WORK FOR ADDITIONAL INVESTIGATIONS

A site-specific health and safety plan will be prepared for the proposed field investigations discussed in this Scope of Work.

Task 1: Evaluation of Water Discharging from Internal Locations

A total of sixteen water samples will be collected from a total of sixteen (16) noted below locations within the Operations Building and locations within the Warehouse Building and submitted to a laboratory for analysis of volatile organic compounds (VOCs) by EPA Method 524.2. For quality control purposes, one duplicate water sample will be collected and the laboratory will provide one trip blank. The laboratory will analyze each of these quality control samples for VOCs by EPA Methods 524.2. The laboratory testing results will be submitted to the NHDES within 45 days of this sampling event.

Sample locations are intended to be as follows:

Operations Building

- ◆ One sample from the faucet located within each of the two men's rest rooms;
- ◆ One sample from the faucet located within each of the two women's restrooms;
- ◆ One sample from the faucet located within the locker room;
- ◆ One sample from the faucet located within the executive rest room;
- ◆ One sample from the shower head located within the room that has a shower;
- ◆ One sample from the faucet located within each of the two lunchrooms.

Warehouse Building

- ◆ One sample from the faucet located within each of the two men's rest rooms;
- ◆ One sample from the faucet located within each of the two women's restrooms;
- ◆ One sample from the shower head located within the room that has a shower;
- ◆ One sample from the faucet located within each of the two lunchrooms.

A risk characterization in accordance with the NHDES "Contaminated Sites Risk Characterization and Management Policy", dated January 1, 1998, with revisions dated April 3, 2001, will be performed to evaluate the risk to human health should VOCs be identified by the laboratory above its method reporting limits in any of these samples.

Task 2: Sampling and Analysis of Liquid/Sludge from Septic Tanks

A liquid and/or sludge sample will be collected directly from the septic tank associated with the leaching system located south of the Operations Building. This sample will be collected as close to the bottom of the septic tank as possible. The sample will be submitted to a laboratory for testing of VOCs by EPA Method 8260B.

For quality control purposes, one duplicate sample from the septic tank will be collected and submitted to the laboratory for analysis for VOCs by EPA Method 8260B.

Laboratory testing results will be submitted to the NHDES within 45 days of this sampling event.

Task 3: Borings and Monitoring Well Installations

The intent of this task is to respond to the NHDES' request that JJA further characterize the extent of the groundwater contamination east of the Operations Building. Therefore, monitoring wells are proposed to be completed at two locations on the JJA property, adjacent to the easterly property line. The two locations are generally described as follows: one location along the easterly property line approximately half way between Supply Well #1 and monitoring well ATC-2; the second location along the easterly property line east of the northern portion of the new addition to the Operations Building. (Note that utilities exist in the vicinity of the eastern property line that may affect the drilling locations. Overhead power lines are essentially coincident with JJA's north-south trending eastern property line. In addition, underground power lines run east-west from the overhead power lines to the Operations Building. It will be necessary for the drilling contractor to have the drilling rig maintain a safe distance from these power lines. Also, underground drainage lines are located between the new addition to the Operations Building and the overhead power lines. Therefore, the proposed drilling locations and the proximity of the proposed drilling locations to the easterly property line, while maintaining locations on the JJA property, is a variable that may not necessarily be easily controlled.)

It should be noted that the monitoring wells previously installed on the JJA property have been completed in both overburden soils and bedrock and the groundwater in both regimes has been shown to contain VOC at varying concentrations. Rather shallow bedrock was encountered at

well ATC-2 (7.5 feet below ground surface) and a bedrock outcropping exists east of Supply Well 1 and ATC-2 on the eastern property line. However, bedrock was encountered at a depth greater than 30 feet below ground surface during the completion of monitoring wells CJ-4S and CJ-4D located north of the Operations Building.

Two bedrock monitoring wells are proposed (for purposes of this Scope of Work, these wells are described as Proposed Wells 1D and 2D), one at each location. However, should field conditions be encountered at each of the proposed locations indicating that saturated soils exist overlying the bedrock, then an additional monitoring well will be completed at each of the two proposed drilling locations within the overburden soils (for purposes of this Scope of Work, these wells are described as Proposed Wells 1S and 2S). Therefore, it is conceivable that two wells will be completed at each of the two drilling locations, one well to monitor the groundwater in the shallower overburden soils and one deeper well to monitor the groundwater in the upper bedrock.

A contractor will be engaged to initially drill two (2) boreholes, one at each of the two proposed locations utilizing a hollow-stem auger or downhole air hammer through the overburden soils and into the underlying bedrock to a maximum depth of 50 each (it is anticipated that bedrock will be encountered at a depth ranging from approximately 10 to 35 feet below ground surface based upon previous investigations at JJA).

Borings advanced with a hollow-stem auger drilling rig will allow for soil samples to be collected at approximate 5-foot intervals using a stainless steel split-spoon sampler. Borings will continue at such intervals to the maximum boring depth or until drilling refusal in the soils, whichever comes first. Soil samples collected with either method will be physically characterized for soil type and texture.

Soil samples collected from these borings will be screened in the field for the potential presence of volatile organic compounds using the headspace technique with a photoionization detector (PID). For the purposes of this scope of work, no soil samples are intended to be submitted to the laboratory for analysis, therefore, no costs have been budgeted herein for laboratory analysis of soils.

Upon completion of the bedrock boreholes, a monitoring well will be constructed in each borehole as follows.

- ◆ Monitoring well pipe will consist of 2-inch diameter, schedule 40, threaded, flush joint polyvinyl chloride (PVC) pipe.
- ◆ The lower extent of the PVC pipe within the borehole of the overburden wells will consist of approximately 10 feet of "screen" with machine-slotted openings and a bottom cap. The length of screen may depending upon the total depth of the boring and the depth of encountered groundwater.
- ◆ The remaining portion of the PVC pipe will consist of 2-inch diameter, schedule 40, threaded, flush joint riser pipe and will extend to the ground surface.
- ◆ Filter sand will be placed exterior to the PVC screen and over the depth interval of the PVC screen, extending approximately 1 to 2 feet above the screen.

- ◆ One to two feet of bentonite pellets or chips will be placed above the filter sand above which will be placed a liquid bentonite seal. The liquid bentonite seal will extend upwards from the bentonite pellets or chips to a depth above the soil/bedrock interface.
- ◆ A metal "road box" flush with the ground surface will be cemented around the PVC pipe at the ground surface.

If at least five feet of saturated, granular soil is encountered at either or both of the two drilling locations, a monitoring well will also be completed in the overburden soils next to each deeper bedrock monitoring well. Monitoring well construction will be similar to that for the bedrock well described above. However, the material used to form the well seal will likely consist of bentonite pellets or chips. Should overburden wells be installed, no soil sampling will be performed.

A qualified scientist will be on-site to observe the borings and monitoring well installations.

These proposed wells are scheduled to be installed such that they may be sampled during the Interim Groundwater Monitoring Program, described in Task 4, intended to commence in November 2001.

Task 4: Interim Groundwater Monitoring Program

This monitoring program addresses the monitoring locations, sampling frequency, and testing parameters outlined in the NHDES' letter of July 10, 2001. Further, Proposed Wells 1S, 1D, 2S, and 2D have also been added to this monitoring program. For purposes of this Scope of Work, the following monitoring program is being established over the course of one (1) year (in this case from November 1, 2001 to October 31, 2002). JJA recognizes that the NHDES may reduce the sampling frequency if favorable testing results are obtained. Further, JJA understands that this Interim Groundwater Monitoring Program will eventually be terminated after discussions with the NHDES and will provide the basis for a future Groundwater Management Permit issued to JJA by the NHDES.

Monitoring locations, sampling frequency [tri-annual for some wells (November 2001, April 2002, and July 2002) and annual for others November 2001], and testing parameters (field and laboratory) are summarized in Table 1 and 2 (attached).

Water samples obtained from JJA Supply Well 2 and 3, the Alliant Well, and the Land & Sea Supply Well will not be collected directly from the wells, as the wells are equipped with submersible pumps and other electrical appurtenances. Rather, sample collection will be from existing taps or spigots at each facility (Note that it will be necessary for JJA to obtain permission from the owner(s)/operator(s) of the Alliant and Land & Sea properties to sample the respective supply wells for each sampling event.) Since JJA Supply Well 1 is used solely for irrigation purposes and is not connected to JJA's internal water distribution system, this well will be sampled in a manner similar to that previously performed. The water sample from Supply Well 1 was collected from a valve opening connected directly to the well. The well will be allowed to discharge water to the ground surface prior to sample collection. Single measurements of pH,

temperature, specific conductance, dissolved oxygen, and oxidation-reduction potential (ORP) will be performed on water obtained from these wells during each sampling event.

Groundwater sampling will be conducted as follows. Purging and sampling of groundwater from monitoring wells will be accomplished with the use of low-flow purging and sampling techniques/device and the use of a flow-through cell to monitor and measure certain chemical parameters in the field. The intake of the pump or the end of the tubing associated with the low-flow device will be lowered to within the screened interval of each well for purging and sampling. Pumping rates will be controlled and varied as necessary. Pumped groundwater from each well exit through tubing connected to the flow-through cell at the ground surface. New, dedicated tubing will be used on each well during each sampling event. The flow-through cell is intended to be equipped with probes to measure pH, temperature, specific conductance, dissolved oxygen, and ORP. Prior to sample collection, water will be purged from these wells and monitored for these parameters. Purge water will be placed in 55-gallons drums pending the results of the laboratory testing.

Based on the previous sampling of groundwater from monitoring well ATC-2, it may be necessary to purge and sample this well with a bailer. If this is the case, a polyethylene bailer will be used to purge approximately three wells volumes from this well prior to collecting samples for laboratory analysis. If the entire volume of water is evacuated from the well prior to purging three well volumes, sample collection will proceed when the water level in the well has recovered sufficiently to obtain the appropriate volume of water for samples. Single measurements of pH, temperature, specific conductance, dissolved oxygen, and ORP will be performed on water obtained from this well if the entire volume of water is not evacuated from the well prior to purging three well volumes.

In addition to the laboratory's own internal quality control program, field quality control measures will also be taken. For each sampling event, appropriate duplicate water samples will be collected and analyzed and the laboratory will provide trip blanks for analysis of VOCs by either EPA Method 524.2 or EPA Method 8260B, as appropriate.

Laboratory testing results will be summarized in table format and compared to Method 1 Groundwater Standards as presented in Table 2 of the NHDES "Contaminated Sites Risk Characterization and Management Policy".

Testing results will be submitted to the NHDES within 45 days of each sampling event.

Task 5: Well Gauging

The previously installed and newly installed groundwater monitoring wells on the JJA property will be gauged for depth to water during each sampling event described in Task 4. Depth to water measurements will be supplied to the NHDES.

Task 6: Well Survey

The elevation and location of the newly installed monitoring wells on the JJA property will be surveyed to the same datum as that for the previously installed monitoring wells. The location of wells will be placed on an existing plan of the site. Well locations and elevation measurements will be supplied to the NHDES.

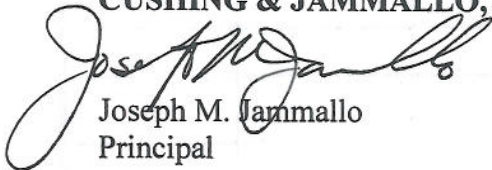
Task 7: Groundwater Flow Direction

The data obtained in Tasks 5 and 6 will be used to evaluate the direction of groundwater flow for sampling events in November 2001, April 2002, and July 2002. Groundwater contour maps generated for each sampling event will be forwarded to the NHDES.

JJA is available to commence this scope of work upon receiving approval from the NHDES. If you should have any questions, please do not hesitate to call us at (978) 774-7224 or Mr. Bob Bean of JJA at (603) 329-5691.

Sincerely,

CUSHING & JAMMALLO, INC.



Joseph M. Jammallo
Principal

Enclosures

C: Bob Bean, Johnson & Johnston Associates, Inc.

Table 1
Matrix of Laboratory Testing Parameters for Proposed Groundwater Sampling and Testing
Sampling Frequency: Nov. 2001, April 2002, July 2002
Johnson & Johnston Associates, Inc.
Hampstead, New Hampshire

Monitoring Location	Testing Parameters						
	pH ¹	Temperture ¹	Specific Conductance ¹	Dissolved Oxygen ¹	Oxidation-Reduction Potential ¹	VOCs by EPA Method 524.2 ²	VOCs by EPA Method 8260B ²
Supply Well 1	X	X	X	X	X	X	
Supply Well 2	X	X	X	X	X	X	
Supply Well 3	X	X	X	X	X	X	
Alliant Well	X	X	X	X	X	X	
Land & Sea Supply Well	X	X	X	X	X	X	
ATC-2	X	X	X	X	X		X
ATC-3	X	X	X	X	X		X
ATC-4-2	X	X	X	X	X		X
CJ-1	X	X	X	X	X		X
CJ-2	X	X	X	X	X		X
CJ-3	X	X	X	X	X		X
CJ-4S	X	X	X	X	X		X
CJ-4D	X	X	X	X	X		X
Proposed Well 1S	X	X	X	X	X		X
Proposed Well 1D	X	X	X	X	X		X
Proposed Well 2S	X	X	X	X	X		X
Proposed Well 2D	X	X	X	X	X		X

NOTES:

¹ Testing to be performed in the field

² Testing to be performed by laboratory

"X" = Analysis to be performed for this parameter

VOCs = Volatile organic compounds

Table 2
Matrix of Laboratory Testing Parameters for Proposed Groundwater Sampling and Testing
Sampling Frequency: November 2001
Johnson & Johnston Associates, Inc.
Hampstead, New Hampshire

Monitoring Location	Laboratory Testing Parameters						
	Total Chloride	Nitrate-Nitrogen	Sulfate	Ferrous Iron	Soluble/Dissolved Manganese	Total Organic Carbon	Methane
Supply Well 1	X	X	X	X	X	X	X
Supply Well 2	X	X	X	X	X	X	X
Supply Well 3	X	X	X	X	X	X	X
Alliant Well	X	X	X	X	X	X	X
Land & Sea Supply Well	X	X	X	X	X	X	X
ATC-2	X	X	X	X	X	X	X
ATC-3	X	X	X	X	X	X	X
ATC-4-2	X	X	X	X	X	X	X
CJ-1	X	X	X	X	X	X	X
CJ-2	X	X	X	X	X	X	X
CJ-3	X	X	X	X	X	X	X
CJ-4S	X	X	X	X	X	X	X
CJ-4D	X	X	X	X	X	X	X
Proposed Well 1S	X	X	X	X	X	X	X
Proposed Well 1D	X	X	X	X	X	X	X
Proposed Well 2S	X	X	X	X	X	X	X
Proposed Well 2D	X	X	X	X	X	X	X

NOTES:

"X" = Analysis to be performed for this parameter



